



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/637,821	08/11/2000	Keith O. Johnson	PACIF-55288	7950
22801	7590	07/18/2006	EXAMINER	
LEE & HAYES PLLC 421 W RIVERSIDE AVENUE SUITE 500 SPOKANE, WA 99201			MEI, XU	
			ART UNIT	PAPER NUMBER
			2615	
DATE MAILED: 07/18/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/637,821		JOHNSON ET AL.	
	Examiner		Art Unit	
	Justin Michalski		2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 and 55-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 55-63 is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/02/05, 4/18/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 60 is objected to because of the following informalities: Claim 60 is dependent on itself. The office has interpreted Claim 60 as dependent of claim 55. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 5, 6, 13, 14, 17, 20-23, 29, 32, 37-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Klippel (Hereinafter Klippel'625) (US Patent 5,438,625).

Regarding Claim 1, Klippel'625 discloses modifying an electrical audio signal for input to a sonic reproduction device that includes a speaker characterized by a plurality of individual responses which in combination define an overall response for the sonic reproduction device (Figs. 7A, 7b and 20a) which includes frequency, time, phase and transient response (It is inherent that model 7a will include frequency, time, phase and transient response as modeled by Figs. 7b and 20a), said apparatus comprising: a plurality of modification filters having modification responses that simulate the plurality of individual responses, at least one said modification filter simulating an individual

Art Unit: 2615

component of the speaker (Fig. 20a, filter 163), the modification filters for receiving the electrical audio signal (Fig. 20a, signal $u(t)$), modifying the electrical audio signal and providing the electrical audio signal to the sonic reproduction device; and a plurality of adjustable parameters (Col. 19, line 66 through Col. 20, line 23), each associated with at least one of the modification filters for allowing adjustments to the responses of the modification filters; wherein the adjustments create a plurality of individual conjugate responses (Col. 2, lines 3-8), each individual conjugate response associated with at least one of the plurality of individual responses.

Regarding Claim 2, Klippel'625 further discloses the plurality of individual responses (Fig. 20a filters 162-166) of the sonic reproduction device are related to mechanical, acoustic, and electromagnetic behavior of the sonic reproduction device.

Regarding Claims 5 Klippel'625 further discloses (Fig. 20A) filters 162-166 are independent of each other (i.e. non-interacting).

Regarding Claim 6, Klippel'625 further discloses the plurality of modification responses combine to form an overall transfer characteristic (i.e. response) that is a conjugate to the overall response for the sonic reproduction device (Col. 2, lines 4-9).

Regarding Claim 13, Klippel'625 discloses a sound compensation system for altering an electrical audio signal for input to a sonic reproduction device including a speaker and an enclosure which have associated behavioral characteristics, said system comprising: a model of the sonic reproduction device having a plurality of filters that simulate at least one of the behavioral characteristics of the sonic reproduction device, each filter having an associated response that combine to define an overall

response for the model (Figs. 7A, 7b, and 20a), at least one said filter simulating an individual component of the speaker (Fig. 20a, filter 163) and another said filter simulating the enclosure (Col. 14, lines 10-14), each response comprising at least one of a frequency, time, phase or transient response (It is inherent that model 7a will include frequency, time, phase and transient response as modeled by Figs. 7b and 20a); and a controller that modifies the response of each of the plurality of filters to transform the filter into a conjugate filter (Col. 2, lines 3-8) having a response that is conjugate to the original response to the filter.

Regarding Claim 14, It is inherent that the behavior characteristics are defined by individual and groups of components of the sonic reproduction device as shown in Figs. 7a and 7b.

Regarding Claim 17, Klippel'625 further discloses adjust able circuit components (Col. 19, line 66 through Col. 20, line 23).

Regarding Claim 20, Klippel'625 further discloses at least one of the plurality of filters comprises at least one associated adjustable parameter and the value of the parameter is derived from a standard speaker model (Figs. 7a and 7b).

Regarding Claims 21 and 22, Klippel'625 discloses adjusting parameters determined experimentally (i.e. optimal values) using standard test measures (Col. 19, line 66 through Col. 20, line 23).

Regarding Claim 23, Klippel'625 further discloses filter 165 relating to the electromagnetic motor force.

Regarding Claim 29, Klippel'625 discloses a sound system comprising: a sonic reproduction device having associated mechanical, acoustic and electromagnetic behavioral characteristics (Fig. 7a); a source for outputting an electrical audio signal to model of the sonic reproduction device, the model having a plurality of filters that simulate at least one of the mechanical, acoustic and electromagnetic behavioral characteristics of the sonic reproduction device (Fig. 7b), at least one said filter simulating an individual component of a speaker of the sonic reproduction device, the plurality of filters providing a overall response of the sonic reproduction device that includes frequency, time, phase, or transient response (It is inherent that model 7a will include frequency, time, phase and transient response as modeled by Figs. 7b and 20a), the model outputting the electrical audio signal to the sonic reproduction device; and a controller that modifies the responses of the filters to transform the model into a conjugate model (Col. 2, lines 3-8) having a plurality of filters with responses that comprise conjugates to the original response of the filter.

Regarding Claims 32 Klippel'625 further discloses (Fig. 20A) filters 162-166 are independent of each other (i.e. non-interacting).

Regarding Claim 37, Klippel'625 discloses a method for modifying an electrical audio signal for input to a sonic reproduction device having a speaker and an enclosure which are characterized by a plurality of individual responses which in combination define an overall response (Figs. 7A, 7b, and 20a) for the sonic reproduction device that includes frequency, time phase, and transient response (It is inherent that model 7a will include frequency, time, phase and transient response as modeled by Figs. 7b and

20a), said method comprising the steps of: simulating the plurality of individual responses with a plurality of filters, wherein at least one said filter simulates an individual component of the speaker and another said filter simulates the enclosure (Col. 14, lines 10-14); adjusting the response of the plurality of filters such that, for each filter, the adjusted response comprises a response that is a conjugate to one of the individual responses (Col. 2, lines 3-8); and inputting the electrical audio signal to the filters.

Regarding Claim 38, Klippel'625 further discloses the plurality of individual responses (Fig. 20a filters 162-166) of the sonic reproduction device are related to mechanical, acoustic, and electromagnetic behavior of the sonic reproduction device.

Regarding Claims 39 Klippel'625 further discloses (Fig. 20A) filters 162-166 are independent of each other (i.e. non-interacting).

Regarding Claim 40, Klippel'625 further discloses the plurality of modification responses combine to form an overall transfer characteristic (i.e. response) that is a conjugate to the overall response for the sonic reproduction device (Col. 2, lines 4-9).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 4, 7, 8, 16, 18-19, 30, 31, 33, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel'625.

Regarding Claims 4, 18, and 31, Klippel'625 discloses use of filters but does not disclose the filters being analog circuits. However, it was well known in the art at the time the invention was made that filters can be constructed with analog components. And to utilize the old and well known analog circuits for the advantage of vastly available components to design filters would have been obvious to one of ordinary skill in the art.

Regarding Claim 19, Klippel'625 discloses a filter associated with damping Fig. 20a, filter 164).

Regarding Claims 7, 8, 33, and 41, Klippel'625 discloses use of modification filters but does not explicitly disclose cut-off filters. It is inherent that the filters will have a cut-off frequency at some values in order to modify the audio signal. It was well known in the art the center frequency of a filter is related to the Q factor by $Q = f_0 / BW$ where f_0 is the center frequency and BW is the bandwidth. It is inherent that frequency response of the filter will be responsive to center frequency and Q parameter.

Regarding Claims 3, 16, and 30, it was well known in the art at the time the invention was made that filters could be implemented using digital processes for the advantage of high speed signal calculation and processing.

6. Claims 9, 10, 34 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel'625 above in view of Simeau (US Patent 4,223,181).

Regarding claims 9, 10, 34 and 42, Klippel'625 discloses an apparatus above but does not disclose the use of a constant slope equalizer filter. It is well known in the art that filters (i.e. equalizers) have constant slope responses to attenuate frequencies outside of a pass band as disclosed by Simeau with a constant slope of 18 dB/octave (Col. 4, lines 48-51). It would have been obvious to one of ordinary skill in the art to design or modify the filters of Klippel'625 with a desired frequency pass band having a constant slope, as shown by Simeau, in order to provide an improved and desired filter having a specific wanted frequency response with a constant slope.

7. Claims 11, 12, 24-28, 35, 36, 43, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klippel'625 above in view of Finn et al. (US Patent 6,295,364) (Hereinafter "Finn").

Regarding Claims 11, 12, 35, 36, 43 and 44, Klippel'625 discloses an apparatus as disclosed above but does not disclose use of a parametric notch filter. Finn discloses filters corresponding to the inverse of the speaker transfer function (Col 3, lines 25-30) including the use of notch filters (Col 2, lines 40-55) to reduce resonance peaks. Therefore, it would have been well known in the art at the time the invention was made to include notch filters to reduce resonance peaks in the audio output. It is well known in the art the center frequency of a filter is related to the Q factor by $Q=f_0/BW$ where f_0 is the center frequency and BW is the bandwidth. It is inherent that frequency response of the filter will be responsive to center frequency and Q parameter.

Regarding Claims 26-28, Klippel'625 discloses an apparatus as disclosed above but does not disclose use of a parametric notch filter. Finn discloses filters corresponding to the inverse of the speaker transfer function (Col 3, lines 25-30) including the use of notch filters (Col 2, lines 40-55) to reduce resonance peaks. Therefore, it would have been well known in the art at the time the invention was made to include notch filters to reduce resonance peaks in the audio output. It is well known in the art the center frequency of a filter is related to the Q factor by $Q=f_0/BW$ where f_0 is the center frequency and BW is the bandwidth. It is inherent that frequency response of the filter will be responsive to center frequency and Q parameter.

Regarding Claims 24, 25, Klippel'625 discloses an apparatus as disclosed above but does not disclose monitoring program conditions at the sonic reproduction device. Finn discloses filters corresponding to the inverse of the speaker transfer function (Col 3, lines 25-30) including monitoring program levels (frequency response; Col 2, lines 30-34) at the sonic reproduction device (Fig. 1, microphone 8).

Allowable Subject Matter

8. Claims 55-63 are allowed.

Conclusion

9. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to **Art Unit 2615**.

Art Unit: 2615

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (571)272-7524. The examiner can normally be reached on M-F 7-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JIM

July 7, 2006


XU MEI
PRIMARY EXAMINER